

CLAIMS:

1. An organ culture device for culturing a viable organ, having:
 - 5 a chamber for containing the viable organ, located along a liquid flow path for a flow of culture medium through the chamber; and
 - a pump provided along the liquid flow path, for pumping the culture medium,
 - 10 wherein the pump has a pump chamber with a net flow direction for culture medium through the pump chamber, a pulsatile pumping action being obtainable by repeated deformation of a deformable wall of the pump chamber, disposed laterally of the net flow direction.
- 15 2. A device according to claim 1 wherein the deformable wall is resilient.
- 20 3. A device according to claim 1 or claim 2 having gas transfer means for gas transfer into or from the culture medium.
- 25 4. A device according to claim 3 wherein said gas transfer means operates by diffusion of gas through a gas-permeable wall.
- 30 5. A device according to any one of the preceding claims wherein said repeated deformation of the deformable wall is obtainable by pressurised gas outside said wall.
6. A device according to claim 5 wherein said

pressurised gas effects gas-transfer into said culture medium:

5 7. A device according to claim 6 wherein said deformable wall of said pump is gas-permeable so that the gas transfer takes place through it.

10 8. A device according to any one of the preceding claims wherein the deformable wall extends substantially circumferentially around the pump chamber.

9. A device according to claim 8 wherein the deformable wall is tubular.

15 10. A device according to any one of the preceding claims wherein the pump has an inlet and an outlet at opposing ends of the pump chamber and located on a longitudinal axis of the pump chamber, the deformable wall being disposed between the inlet and outlet and
20 substantially parallel to the longitudinal axis.

11. A device according to any one of the preceding claims wherein the liquid flow path or a part of the liquid flow path extends from a reservoir for supplying
25 culture medium to be pumped towards the chamber.

12. A device according to any one of the preceding claims further having culture medium collection means, disposed downstream of the chamber.

30

13. A device according to claim 12 wherein the chamber and the collection means are in communication via a flow

restrictor.

14. A device according to any one of the preceding claims wherein the liquid flow path, or a part of the liquid flow path, forms a liquid flow circuit, at least some of the culture medium being allowed to recirculate in use.
15. A device according to any one of the preceding claims including a sampling port located downstream of the chamber, for sampling of the culture medium.
16. A device according to any one of the preceding claims in use containing a viable organ in said chamber and circulating culture medium in said liquid flow circuit.
17. A method of maintaining a viable organ for transport and storage, using an organ culture device according to any one of the preceding claims.
18. An organ culture device according to any one of the preceding claims sterilized in readiness for housing a viable organ and contained within a sealed enclosure for maintaining its sterilized state.
19. An organ culture device according to claim 4, 5 or 6 further including a gas pressure control device for controlling gas flow to provide pulsed flow of pressurized gas to said pump, the organ culture device being sterilized in readiness for housing a viable organ and contained within a sealed enclosure maintaining its

sterilized state.

20. A pump for liquid having:

5 a pumping chamber for the liquid, there being a net
flow direction in the pumping chamber for pumped liquid;
and

a pumping member for acting on the liquid in the
form of a deformable wall of the pump chamber, disposed
laterally of the new flow direction,

10 wherein the deformable wall is acted on by pulses of
pressurised gas to cause pumping.

21. A pump according to claim 20 wherein the deformable
wall is resilient.

15

22. A pump according to claim 20 or claim 21 wherein the
deformable wall extends substantially circumferentially
around the pump chamber.

20 23. A pump according to any one of claims 20 to 22
wherein the deformable wall is tubular.

24. A pump according to any one of claims 20 to 23
having means for generating a pulsed flow of pressurised
25 gas from a reservoir of pressurised gas.

25. A pump according to any one of claims 20 to 24
wherein said deformable wall is gas-permeable, for gas
transfer between the pumped liquid and the pressurised
30 gas.

26. A gas pressure control device for delivering pulsed

pressurised gas, comprising a gas accumulator chamber having an inlet for connection to a source of pressurised gas and an outlet, the gas accumulator chamber being resiliently expansible by movement of a movable wall thereof, the device having a valve member movable between a closed position closing said outlet and an open position permitting outflow through said outlet, the device further having means actuated by the movement of the movable wall of the accumulator chamber to move the valve member from the closed position to the open position when a predetermined pressure is reached in the accumulator chamber and means for returning the valve member to the closed position upon contraction of the accumulator chamber following release of a volume of gas therefrom.

27. A device according to claim 26 wherein the accumulator chamber is a piston-and-cylinder assembly.

28. A device according to claim 26 or 27 wherein the movable wall carries an actuating member which initiates movement of the valve member away from its closed position.

29. A device according to any one of claims 26 to 28 having biasing means, operating on the valve member during its movement from its closed position, whereby after removal of the pressure differential across the valve member upon its opening the valve member is moved by the biasing means to its open position.

30. Use of a pump according to any one of claims 20 to

25 or a device according to any one of claims 26 to 29 in human or veterinary medicine.

5 31. An organ culture device according to claim 1 having, as said pump thereof, a pump according to claim 20.

10 32. An organ culture device according to claim 31 having a gas pressure control device according to any one of claims 26 to 29 for delivering pulsed pressurized gas to said pump.

15 33. A pump according to any one of claims 20 to 25 having a gas pressure control device according to any one of claims 26 to 29 for delivering pulsed pressurized gas thereto.